

WHAT IS CLAIMED IS:

1 1. A bulkhead assembly for use with an
inflatable modular structure, the inflatable modular
structure having at least two longerons, an inflatable
bladder having an opening on opposing ends, and a
5 flexible restraint layer having an opening on opposing
ends and a plurality of attachment loops on each end,
the bulkhead assembly comprising:

 a plate having an inner surface;

 a plurality of longitudinal restraint

10 fittings;

 a first bladder flange;

 a second bladder flange;

 a plurality of flange seals;

 at least two longeron sleeves;

15 each longeron sleeve being fixedly secured

 to the inner surface of the plate and

 adapted to securedly receive a longeron;

 the first and second bladder flanges being

 adapted to securedly receive one of the

20 opposing ends of the inflatable bladder

 therebetween;

 the second bladder flange being secured to

 the inner surface of the plate with the

25 plurality of flange seals secured
between the plate and second bladder
flange; and

the plurality of longitudinal restraint
fittings being secured to the plate and
each of the longitudinal restraint
30 fittings adapted to receive an
attachment loop from one of the opposing
ends of the flexible restraint layer
such that the restraint layer
substantially encompasses the inflatable
35 bladder.

1 2. The bulkhead assembly of claim 1 wherein
each longitudinal restraint fitting is substantially
"U" shaped defining opposing posts and each
longitudinal restraint fitting further comprises a
5 roller being secured between the opposing posts and
adapted to receive an attachment loop around the
roller.

1 3. The bulkhead assembly of claim 1 wherein the
plate has an access opening.

1 4. The bulkhead assembly of claim 1 wherein the
plate further comprises an outer surface, the outer
surface being adapted to receive an airlock assembly.

1 5. The bulkhead assembly of claim 1 wherein the
plate further comprises an outer surface, the outer
surface being adapted to receive a distal end
assembly.

1 6. The bulkhead assembly of claim 1 wherein the
plate further comprises an outer surface, said outer
surface and inner surface having a plurality of
bulkhead load pads.

1 7. The bulkhead assembly of claim 1 wherein the
longitudinal restraint fittings are adjacent to the
second bladder flange.

1 8. A bulkhead assembly for use with an
inflatable modular structure, the inflatable modular
structure having at least two longerons, an inflatable
bladder having an opening on opposing ends, and a
5 flexible restraint layer having an opening on opposing
ends and a plurality of attachment loops on each end,
the bulkhead assembly comprising:

 a plate;

 means for securing the longerons to the

10 plate;

 means for securing one of the opposing ends

 of the inflatable bladder to the plate;

 and

means for securing the attachment loops on
15 one of the opposing ends of the
flexible restraint layer to the plate.

1 9. A method for attaching a bulkhead assembly to
an inflatable modular structure, the inflatable
modular structure having at least two longerons, an
inflatable bladder having an opening on opposing ends,
5 and a flexible restraint layer having an opening on
opposing ends and a plurality of attachment loops on
each end, the method of attaching the bulkhead
assembly comprising the steps of:

securing the longerons to the bulkhead
10 assembly;
securing one opposing end of the inflatable
bladder to the bulkhead assembly; and
securing the attachment loops on one of the
opposing ends of the flexible restraint
15 layer to the bulkhead assembly.

1 10. The method for attaching a bulkhead assembly
to an inflatable modular structure in claim 9 using
the bulkhead assembly of claim 3.

1 11. A method for attaching a bulkhead assembly
to an inflatable modular structure, the inflatable
modular structure having at least two longerons, an

inflatable bladder having an opening on opposing ends,
5 and a flexible restraint layer having an opening on
opposing ends and a plurality of attachment loops on
each end, the method of attaching the bulkhead
assembly comprising the steps of:

securing the longerons to the bulkhead
10 assembly of claim 1;

securing one opposing end of the inflatable
bladder to the bulkhead assembly of
claim 1; and

securing the attachment loops to the
15 bulkhead assembly of claim 1.

1 12. A method for attaching a bulkhead assembly
to an inflatable modular structure, the inflatable
modular structure having at least two longerons, an
inflatable bladder having an opening on opposing ends,
5 and a flexible restraint layer having an opening on
opposing ends and a plurality of attachment loops on
each end, the method of attaching the bulkhead
assembly comprising the steps of:

securing the longerons to the bulkhead
10 assembly of claim 8;

securing one opposing end of the inflatable
bladder to the bulkhead assembly of
claim 8; and

securing the attachment loops to the
15 bulkhead assembly of claim 8.

1 13. A method for attaching a bulkhead assembly
to opposing ends of an inflatable modular structure,
the inflatable modular structure having a truss
comprised of at least two longerons and each longeron
5 having a fore and an aft end, an inflatable bladder
having a first and second opening on opposing ends,
and a flexible restraint layer having a first and
second opening on opposing ends and a plurality of
attachment loops on each end, the method of attaching
10 the bulkhead assemblies comprising the steps of:

securing the fore ends of the longerons to a
first bulkhead assembly as in claim 1;

securing the aft ends of the longerons to a
second bulkhead assembly as in claim 3;

15 securing the first opposing end of the
inflatable bladder to a first bulkhead
assembly as in claim 1;

securing the second opposing end of the
inflatable bladder to a second bulkhead
20 assembly as in claim 3;
securing the attachment loops on the first
opposing end of the restraint layer to a
first bulkhead as in claim 1; and
securing the attachment loops on the second
25 opposing end of the restraint layer to a
second bulkhead as in claim 3 such that
the restraint layer substantially
encompasses the inflatable bladder.

1 14. A method for attaching a bulkhead assembly
to opposing ends of an inflatable modular structure,
the inflatable modular structure having a truss
comprised of at least two longerons and each longeron
5 having a fore and an aft end, an inflatable bladder
having a first and second opening on opposing ends,
and a flexible restraint layer having a first and
second opening on opposing ends and a plurality of
attachment loops on each end, the method of attaching
10 the bulkhead assemblies comprising the steps of:

securing the fore ends of the longerons to a
first bulkhead assembly as in claim 8;

securing the aft ends of the longerons to a
second bulkhead assembly as in claim 8;
15 securing the first opposing end of the
inflatable bladder to a first bulkhead
assembly as in claim 8;
securing the second opposing end of the
inflatable bladder to a second bulkhead
20 assembly as in claim 8;
securing the attachment loops on the first
opposing end of the restraint layer to a
first bulkhead as in claim 8; and
securing the attachment loops on the second
25 opposing end of the restraint layer to a
second bulkhead as in claim 8.

15. An inflatable modular structure utilizing
two bulkhead assemblies, the inflatable modular
structure having at least two longerons each having
fore and aft ends, an inflatable bladder having an
5 opening on opposing ends, and a flexible restraint
layer having an opening on opposing ends and a
plurality of attachment loops on each end, the
inflatable modular structure utilizing two bulkhead
assemblies comprising:

10 a first and second bulkhead assembly as in
 claim 3;

 the fore ends of the plurality of longerons
 securedly attached to a plurality of
 longeron sleeves on the first bulkhead
15 assembly;

 the aft ends of the plurality of longerons
 securedly attached to a plurality of
 longeron sleeves on the second bulkhead
 assembly;

20 one end of the inflatable bladder being
 attached to the first bulkhead assembly;
 the opposing end of the inflatable bladder
 being attached to the second bulkhead
 assembly;

25 one end of the restraint layer being attached
 to the first bulkhead assembly;
 the opposing end of the restraint layer being
 attached to the second bulkhead
 assembly.

1 16. An inflatable modular structure utilizing
 two bulkhead assemblies, the inflatable modular
 structure having at least two longerons each having
 fore and aft ends, an inflatable bladder having an

5 opening on opposing ends, and a flexible restraint layer having an opening on opposing ends and a plurality of attachment loops on each end, the inflatable modular structure utilizing two bulkhead assemblies comprising:

10 a first and second bulkhead assembly as in claim 8;

the fore ends of the plurality of longerons securedly attached to a plurality of longeron sleeves on the first bulkhead assembly;

15 the aft ends of the plurality of longerons securedly attached to a plurality of longeron sleeves on the second bulkhead assembly;

20 one end of the inflatable bladder being attached to the first bulkhead assembly; the opposing end of the inflatable bladder being attached to the second bulkhead assembly;

25 one end of the restraint layer being attached to the first bulkhead assembly;

the opposing end of the restraint layer being
attached to the second bulkhead
assembly.

1 17. An inflatable modular structure utilizing
two bulkhead assemblies, the inflatable modular
structure having at least two longerons each having
fore and aft ends, an inflatable bladder having an
5 opening on opposing ends, and a flexible restraint
layer having an opening on opposing ends and a
plurality of attachment loops on each end, the
inflatable modular structure utilizing two bulkhead
assemblies comprising:

10 a first bulkhead assembly as in claim 3;
a second bulkhead assembly as in claim 6 and
further comprising an access opening;
means for securing the fore ends of the
plurality of longerons to the first
15 bulkhead assembly;
means for securing the aft ends of the
plurality of longerons to the second
bulkhead assembly;
means for securing one end of the inflatable
20 bladder to the first bulkhead assembly;

means for securing the opposing end of the
inflatable bladder to the second
bulkhead assembly;

means for securing one end of the restraint
25 layer to the first bulkhead assembly;

means for securing the opposing end of the
restraint layer to the second bulkhead
assembly such that the flexible
restraint layer substantially
30 encompasses the inflatable bladder.

1 18. An inflatable modular structure utilizing
two bulkhead assemblies, the inflatable modular
structure having at least two longerons each having
fore and aft ends, an inflatable bladder having an
5 opening on opposing ends, and a flexible restraint
layer having an opening on opposing ends and a
plurality of attachment loops on each end, the
inflatable modular structure utilizing two bulkhead
assemblies comprising:

10 a first and second bulkhead assembly each as
in claim 8;

means for securing the fore ends of the
plurality of longerons to the first
bulkhead assembly;

15 means for securing the aft ends of the
plurality of longerons to the second
bulkhead assembly;
means for securing one end of the inflatable
bladder to the first bulkhead assembly;
20 means for securing the opposing end of the
inflatable bladder to the second
bulkhead assembly;
means for securing one end of the restraint
layer to the first bulkhead assembly;
25 means for securing the opposing end of the
restraint layer to the second bulkhead
assembly such that the restraint layer
substantially encompasses the inflatable
bladder.

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